

CLAIMS

WE CLAIM:

1 1. An electrical apparatus, comprising:
2 at least one blade on an end of an interconnection element, said blade having a
3 given length and oriented on the interconnection element such that said length runs
4 substantially parallel to a horizontal motion of said blade relative to an electrical
5 terminal.

2 2. The electrical apparatus of claim 1 wherein the horizontal motion of said blade
occurs when said blade makes an electrical contact with the electrical terminal.

3 3. The electrical apparatus of claim 2 wherein said blade has a truncated pyramid
4 cross-sectional structure.

5 4. The electrical apparatus of claim 2 wherein said blade has a sharpened edge
along said length of said blade.

6 5. The electrical apparatus of claim 4 wherein said blade has a cross-sectional
7 structure with a front edge at a first end of said length of said blade and a back edge at
8 a second end of said length of said blade.

9 6. The electrical apparatus of claim 5 wherein said front and back edges are
10 rectilinear.

11 7. The electrical apparatus of claim 5 wherein said front and back edges are
12 pyramidal.

1 8. The electrical apparatus of claim 5 wherein said front and back edges have two
2 sides such that said blade has a hexagonal shape.

1 9. A tip structure, comprising:
2 a foot having an upper and a lower surface; and,
3 at least one blade on said upper surface of said foot, said blade having a given
4 length and oriented on said foot such that said length runs substantially parallel to a
5 horizontal motion of said foot.

1 10. The tip structure of claim 9 wherein the horizontal motion of said foot occurs
2 when said tip structure makes an electrical contact with an electrical terminal.

1 11. The tip structure of claim 9 further comprising a resilient contact element coupled
2 to said lower surface of said foot.

1 12. The tip structure of claim 9 wherein said blade has a sharpened edge along said
2 length of said blade.

1 13. The tip structure of claim 12 wherein said blade has a primary edge at a front
2 end of said blade and a trailing edge at a back end of said blade.

1 14. The tip structure of claim 12 having a first and a second blade on said upper
2 surface of said foot.

1 15. The tip structure of claim 14 wherein said first and second blades are joined by a
2 bridge.

1 16. The tip structure of claim 14 wherein said first and second blades are in a
2 juxtaposed position.

1 17. The tip structure of claim 12 wherein said blade has a triangular cross-sectional
2 structure with a front edge at a first end of said length of said blade and a back edge at
3 a second end of said length of said blade.

1 18. The tip structure of claim 17 wherein said front and back edges are rectilinear.

1 19. The tip structure of claim 17 wherein said front and back edges are pyramidal.

1 20. The tip structure of claim 17 wherein said front and back edges have two sides
2 such that said blade has a hexagonal shape.

1 21. A tip structure, comprising:
2 a foot having an upper and a lower surface; and,
3 at least one blade on said upper surface of said foot, said blade having a given
4 length and oriented on said foot such that said length is within approximately $\pm 45^\circ$ of an
5 axis parallel to a horizontal motion of said foot.

1 22. The tip structure of claim 21 wherein said blade has a sharpened edge along
2 said length of said blade.

1 23. The tip structure of claim 22 having a first and a second blade on said upper
2 surface of said foot.

1 24. The tip structure of claim 23 wherein said first and second blades are joined by a
2 bridge.

1 25. The tip structure of claim 23 wherein said first and second blades are in a
2 juxtaposed position.

1 26. The tip structure of claim 22 wherein said blade has a triangular cross-sectional
2 structure with a front edge at a first end of said length of said blade and a back edge at
3 a second end of said length of said blade.

1 27. The tip structure of claim 26 wherein said front and back edges are rectilinear.

1 28. The tip structure of claim 26 wherein said front and back edges are pyramidal.

1 29. The tip structure of claim 26 wherein said front and back edges have two sides
2 such that said blade has a hexagonal shape.

1 30. An electrical contact structure comprising:
2 a plurality of interconnection elements disposed in relationship with one another;
3 a plurality of tip structures affixed to respective ones of said interconnection
4 elements, each of said tip structures further comprising:
5 at least one blade on a contact point of a respective one of said
6 interconnection elements, said blade having a given length and oriented on the
7 respective one of said interconnection elements such that said length runs substantially
8 parallel to a horizontal motion of the respective one of said interconnection elements
9 when the respective one of said interconnection elements makes an electrical contact.

1 31. The electrical contact structure of claim 30 wherein the horizontal motion of said
2 foot occurs when said tip structure makes electrical contact with an electrical surface.

1 32. The electrical contact structure of claim 31 wherein said blade has a sharpened
2 edge along said length of said blade.

1 33. The electrical contact structure of claim 32 wherein said blade has a triangular
2 cross-sectional structure with a front edge at a first end of said length of said blade and
3 a back edge at a second end of said length of said blade.

1 34. The electrical contact structure of claim 33 wherein said front and back edges
2 are rectilinear.

1 35. The electrical contact structure of claim 33 wherein said front and back edges
2 are pyramidal.

1 36. The electrical contact structure of claim 33 wherein said front and back edges
2 have two sides such that said blade has a hexagonal shape.

1 37. A method of making an electrical contact structure, comprising the steps of:
2 forming a trench in a sacrificial substrate;
3 depositing at least one layer of at least one conductive material in said trench to
4 form a blade having a given length, an upper surface, and a lower surface; and,

5 coupling an interconnection element to said lower surface of said blade, wherein
6 said blade is oriented such that said length of said blade runs substantially parallel to a
7 horizontal motion of said blade.

1 38. The method of claim 37 further comprising the step of releasing said blade from
2 said sacrificial substrate.

1 39. The method of claim 38 wherein said step of releasing said blade from said
2 sacrificial substrate further comprises releasing said blade from said sacrificial substrate
3 by a process selected from the group consisting of heat and chemical etching.

1 40. The method of claim 37 wherein said step of forming a trench further comprises
2 etching a trench in a substrate with a potassium hydroxide selective etch.

1 41. The method of claim 40 wherein said step of etching a trench further comprises
2 etching a trench in a substrate with a potassium hydroxide etch between the 111 and
3 001 crystal orientation.

1 42. The method of claim 37 wherein said step of forming a trench further comprises
2 forming a trench in a substrate, wherein said trench has a triangular cross-section.

1 43. The method of claim 37 wherein said step of forming a trench further comprises
2 forming a trench in a substrate, wherein said trench has a truncated pyramid cross-
3 section.

1 44. The method of claim 37 wherein said step of coupling said interconnection
2 element to said lower surface of said blade further comprises soldering said
3 interconnection element to said lower surface of said blade.

1 45. The method of claim 37 wherein said step of coupling said interconnection
2 element to said lower surface of said blade further comprises brazing said
3 interconnection element to said lower surface of said blade.